

Customer No.: 31561
Application No.: 10/707,632
Docket No.: 12398-US-PA

REMARKS

Present Status of the Application

It is noted with great appreciation that the Examiner indicated claim 10 would be allowed if rewritten to overcome the rejections under 35 U.S.C. 112, second paragraph, set forth in this Office Action and to include all of the limitations of the base claim and any intervening claims. Accordingly, Applicants have amended Claim 10 into independent form by integrating the limitations of base claims 7 and 8 into Claim 10. Claim 10 should be in proper condition for allowance. Furthermore, new claims 23-27 dependent from claim 10 would also be allowable.

Claims 7-10, 14-16 and 17-34 are pending of which claims 7-9 have been amended and claims 17-34 have been newly added and claims 14-16 have been canceled in order to more explicitly describe the claimed invention. Amendments to claim 7 and the subject matters of the new claims 28-34 are well supported by paragraphs [0024], [0010] and [0022]. Therefore, it is believed that no new matter adds by way of amendments made to claims or otherwise to the application. For at least the following reasons, Applicants respectfully submit that claims 7-10 and 17-34 patently define over prior art of record and reconsideration of this application is respectfully requested.

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Discussion of the claim rejection under 35 USC 112

The Office Action rejected claims 8-10 under 35 USC 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In rejecting the above claims, Examiner stated that with respect to claim 8, term "much" is a relative term which renders the claim indefinite. The term "much" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The Examiner suggested deleting the term "much". With respect to claim 9, "the etching process" lacks antecedent basis. It is unclear if "the etching process" of claim 9 is the equivalent of the "etching operation" of claim 8 or "the etching process" is an additional etching step or steps used only to remove the patterned photoresist layer and the anti-reflection coating.

In response thereto, Applicants would like to thank the Examiner for pointing out the informalities and accordingly amended claims 8 and 9. After entry of the above amendments to claims 8 and 9, it is believed that the above rejections can be overcome. Reconsideration is respectfully requested.

Discussion of the claim rejection under 35 USC 102

The Office Action rejected claims 7-9 under 35 USC 102(b) as being anticipated by Lee et al. (US-2001/0051425, hereinafter Lee).

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Applicants respectfully disagree and traverse the above rejections as set forth below. The proposed amended independent claim 7 is allowable for at least the reason that Lee substantially fails to teach or disclose each and every features of the amended proposed independent claims 1.

More specifically, Lee fails to teach or disclose a method of fabricating a semiconductor device comprising at least a step of "providing a substrate having at least a film layer, an optical isolation layer, an anti-reflection coating and a photoresist layer sequentially formed thereon, wherein [the optical isolation layer has a light absorption coefficient sufficient to block light incident through the anti-reflection coating thereon]", as required by the amended independent claim 7.

Instead, Lee, at paragraphs [0020] and [0021], substantially discloses a method of fabricating a contact hole comprising sequentially forming an inter-layer dielectric layer (115), a polysilicon layer (120) doped with impurities, an antireflection layer (125) and a photoresist layer. However, Lee is totally silent about forming an optical layer (or the polysilicon layer) with a light absorption coefficient sufficient to block light incident through the anti-reflection layer. Instead, Lee substantially teaches that the antireflection layer (125) prevents formation of the photoresist pattern with more than the desired linewidth caused by the reflection of the light irradiated onto the entire surface of the semiconductor substrate during the photolithography process for forming the photoresist pattern (130) (please see lines 7-12 of paragraph [0021]). In other words, Applicants respectfully submit that it is clear that Lee substantially fails to recognize the antireflection layer (125) though capable of minimizing the interference between the incoming light and the reflected light during the

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photolithography process but some of the light still passes through the anti-reflection layer to adversely affect the Critical Dimensions of the photoresist pattern. Instead, Lee substantially teaches that the anti-reflection layer 125 itself is sufficient to absorb the light to prevent formation of the photoresist pattern with more than the desired linewidth cause by the reflection of the light irradiated onto the entire surface of the semiconductor substrate during the photolithography process. Therefore, Lee substantially teaches away from the claimed invention in this regard.

Furthermore, Lee, at lines 2-3 of paragraph [0024] and lines 4-7 of paragraph [0031], substantially teaches the polysilicon layer is used as an etch mask and also for serving as storage node pattern (140a/120c). Therefore, it is clear that Lee does not teach to use the polysilicon layer (120) to block the light incident through the anti-reflection layer, much less teaching on using an optical layer with a light absorption coefficient sufficient block the light incident through the anti-reflection layer. Accordingly, Applicants respectfully submit that Lee cannot possibly anticipate claims 7 in this regard.

Applicants would like to point out that it should not be necessary to point out that a patentable invention may lie in the discovery of the source of a problem even though the remedy may be obvious once the source of the problem is identified. The question here is whether the prior art recognized the cause of the problem.

Applicants would like to point out that because Lee substantially fails to teach that the polysilicon layer (120) has a light absorption coefficient sufficient to block light incident through the antireflection layer, and therefore, it is unclear whether the polysilicon layer (120) of Lee is capable of blocking the light penetrating through the antireflection layer

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(125). Furthermore, Applicants would also like to point out that in determining the relevant art of the claims in suit one looks to the nature of the problem confronting the inventor. Inherency is not necessarily coterminous with the knowledge of those skilled in the art...artisan of ordinary skill may not recognize the inherent characteristics or functioning of the prior art.

Therefore, it is clear that Lee substantially fails to teach or disclose each and every features of the claimed invention as claimed in the amended proposed independent claim 7, and therefore the amended proposed independent claim 7 should be allowed.

Furthermore, Lee also substantially fails to teach, disclose or hint a method of fabricating a semiconductor device comprising at least a step of "providing a substrate having at least a film layer, an optical isolation layer, an anti-reflection coating and a photoresist layer sequentially formed thereon, wherein [the optical isolation layer has a light absorption coefficient greater than 1.8]", as required by the newly added independent claim 28. Therefore, Lee cannot possibly anticipate the newly added independent claim 28 in this regard.

Claims 8-9 and 29-34, which depend from independent Claims 7 and 28 respectively, directly or indirectly, are also patentable over Lee, at least because of their dependency from an allowable base claims.

For at least the foregoing reasons, Applicants respectfully submit that claims 7-9 and 28-34 patently define over Lee, and therefore should be allowed. Reconsideration and withdrawal of the above rejections is respectfully requested.

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CONCLUSION

For at least the foregoing reasons, it is believed that all the pending claims 7-10 and 17-34 of the present application patently define over the prior art and are in proper condition for allowance. If the Examiner believes that a telephone conference would expedite the examination of the above-identified patent application, the Examiner is invited to call the undersigned.

Respectfully submitted

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